Get Energized! Science on Wheels 2006-2007
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New Mexico Science Content Standards, Benchmarks, and Performance Standards

Strands and Benchmarks

Kindergarten – 4th Grade

Strand II: Content of Science
Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

K-4 Benchmark II: Know that energy is needed to get things done and that energy has different forms.

Grade	**Performance Standards**
K	Observe how energy does things (e.g., batteries, the sun, wind, electricity).
1	Observe and describe how energy produces changes (e.g., heat melts ice, gas makes car go uphill, electricity makes TV work).
2	Describe how heat can be produced (e.g., burning, rubbing, mixing some substances). Describe the usefulness of some forms of energy (e.g., electricity, sunlight, wind, sound) and how energy (e.g., heat, light,) can affect common objects (e.g., sunlight warms dark objects, heat melts candles). Observe that sound is made by vibrating objects and describe it by its pitch and loudness. Recognize that moving objects carry energy (kinetic energy).
3	Understand that light is a form of energy and can travel through a vacuum.
4	Identify the characteristics of several different forms of energy and describe how energy can be converted from one form to another (e.g., light to heat, motion to heat, electricity to heat, light, or motion). Recognize that energy can be stored in many ways (e.g., potential energy in gravity or springs, chemical energy in batteries). Demonstrate how electricity flows through a simple circuit (e.g., by constructing one).

Strand II: Content of Science
Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.

K-4 Benchmark I: Know that living things have diverse forms, structures, functions, and habitats.

Grade	**Performance Standards**
1	Know that living organisms (e.g., plants, animals) have needs (e.g., water, air, food, sunlight).
4	Describe how roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight (photosynthesis). Describe the components of and relationships among organisms in a food chain (e.g., plants are the primary source of energy for living systems).

5th – 8th Grade

Strand II: Content of Science
Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

5-8 Benchmark II: Explain the physical processes involved in the transfer, change, and conservation of energy.

GradePerformance Standards

5 Know that heat is transferred from hotter to cooler materials or regions until both reach the same temperature.
Know that heat is often produced as a by-product when one form of energy is converted to another form (e.g., when machines or organisms convert stored energy into motion).
Know that there are different forms of energy.
Describe how energy can be stored and converted to a different form of energy (e.g., springs, gravity) and know that machines and living things convert stored energy to motion and heat.

6 Identify various types of energy (e.g., heat, light, mechanical, electrical, chemical, nuclear).
Understand that heat energy can be transferred through conduction, radiation and convection.
Know that there are many forms of energy transfer but that the total amount of energy is conserved (i.e., that energy is neither created nor destroyed).
Understand that some energy travels as waves (e.g., seismic, light, sound), including:

- the sun as source of energy for many processes on Earth
- different wavelengths of sunlight (e.g., visible, ultraviolet, infrared)
- vibrations of matter (e.g., sound, earthquakes)
    - different speeds through different materials.

7 Know how various forms of energy are transformed through organisms and ecosystems, including:

- sunlight and photosynthesis
- energy transformation in living systems (e.g., cellular processes changing chemical energy to heat and motion)
- effect of mankind's use of energy and other activities on living systems (e.g., global warming, water quality).

8 Energy Transformation
Know that energy exists in many forms and that when energy is transformed some energy is usually converted to heat.
Know that kinetic energy is a measure of the energy of an object in motion and potential energy is a measure of an object's position or composition, including:

- transformation of gravitational potential energy of position into kinetic energy of motion by a falling object.

Distinguish between renewable and nonrenewable sources of energy.
Know that electrical energy is the flow of electrons through electrical conductors that connect sources of electrical energy to points of use, including:

- electrical current paths through parallel and series circuits
- production of electricity by fossil-fueled and nuclear power plants, wind generators, geothermal plants, and solar cells
- use of electricity by appliances and equipment (e.g., calculators, hair dryers, light bulbs, motors).

Strand II: Content of Science
Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.

5-8 Benchmark III: Understand the structure of organisms and the function of cells in living systems.

GradePerformance Standards
Describe the relationships among cells, tissues, organs, organ systems, whole organisms, and ecosystems.
6 Explain how fossil fuels were formed from animal and plant cells.
8 Describe how cells use chemical energy obtained from food to conduct cellular functions (i.e., respiration).
Explain that photosynthesis in green plants captures the energy from the sun and stores it chemically.